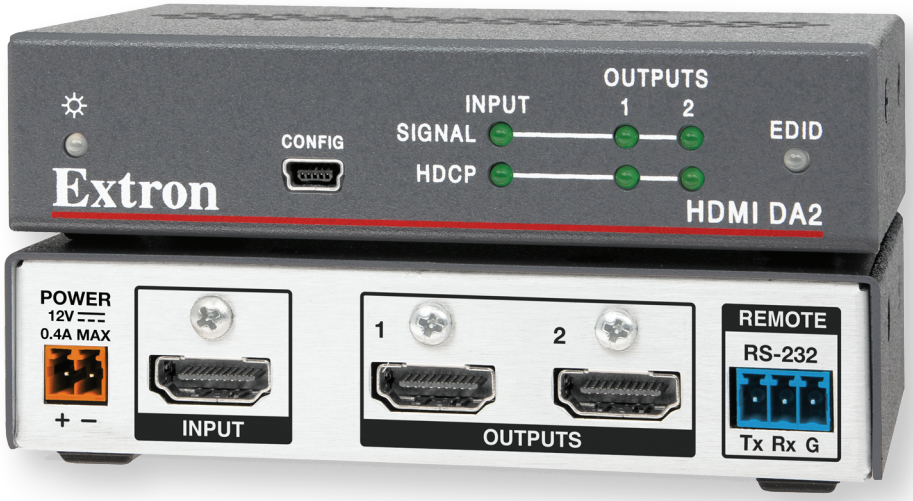
# User Guide

HDMI®

# HDMI DA2

## Distribution Amplifier




Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

68-1844-01 Rev. B
10 13

# Safety Instructions

## Safety Instructions • English

**WARNING:** This symbol, ⚠, when used on the product, is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

**ATTENTION:** This symbol, ⚠, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the Extron Safety and Regulatory Compliance Guide, part number 68-290-01, on the Extron website, **www.extron.com**.

## Instructions de sécurité • Français

**AVERTISSEMENT:** Ce pictogramme, ⚠, lorsqu'il est utilisé sur le produit, signale à l'utilisateur la présence à l'intérieur du boîtier du produit d'une tension électrique dangereuse susceptible de provoquer un choc électrique.

**ATTENTION:** Ce pictogramme, ⚠, lorsqu'il est utilisé sur le produit, signale à l'utilisateur des instructions d'utilisation ou de maintenance importantes qui se trouvent dans la documentation fournie avec le matériel.

Pour en savoir plus sur les règles de sécurité, la conformité à la réglementation, la compatibilité EMI/EMF, l'accessibilité, et autres sujets connexes, lisez les informations de sécurité et de conformité Extron, réf. 68-290-01, sur le site Extron, **www.extron.fr**.

## Sicherheitsanweisungen • Deutsch

**WARNUNG:** Dieses Symbol ⚠ auf dem Produkt soll den Benutzer darauf aufmerksam machen, dass im Inneren des Gehäuses dieses Produktes gefährliche Spannungen herrschen, die nicht isoliert sind und die einen elektrischen Schlag verursachen können.

**VORSICHT:** Dieses Symbol ⚠ auf dem Produkt soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Weitere Informationen über die Sicherheitsrichtlinien, Produkthandhabung, EMI/EMF-Kompatibilität, Zugänglichkeit und verwandte Themen finden Sie in den Extron-Richtlinien für Sicherheit und Handhabung (Artikelnummer 68-290-01) auf der Extron-Website, **www.extron.de**.

## Instrucciones de seguridad • Español

**ADVERTENCIA:** Este símbolo, ⚠, cuando se utiliza en el producto, avisa al usuario de la presencia de voltaje peligroso sin aislar dentro del producto, lo que puede representar un riesgo de descarga eléctrica.

**ATENCIÓN:** Este símbolo, ⚠, cuando se utiliza en el producto, avisa al usuario de la presencia de importantes instrucciones de uso y mantenimiento recogidas en la documentación proporcionada con el equipo.

Para obtener información sobre directrices de seguridad, cumplimiento de normativas, compatibilidad electromagnética, accesibilidad y temas relacionados, consulte la Guía de cumplimiento de normativas y seguridad de Extron, referencia 68-290-01, en el sitio Web de Extron, **www.extron.es**.

## Инструкция по технике безопасности • Русский

**ПРЕДУПРЕЖДЕНИЕ:** Данный символ, ⚠, если указан на продукте, предупреждает пользователя о наличии неизолированного опасного напряжения внутри корпуса продукта, которое может привести к поражению электрическим током.

**ВНИМАНИЕ:** Данный символ, ⚠, если указан на продукте, предупреждает пользователя о наличии важных инструкций по эксплуатации и обслуживанию в руководстве, прилагаемом к данному оборудованию.

Для получения информации о правилах техники безопасности, соблюдении нормативных требований, электромагнитной совместимости (ЭМП/ЭДС), возможности доступа и других вопросах см. руководство по безопасности и соблюдению нормативных требований Extron на сайте Extron: **www.extron.ru**, номер по каталогу - 68-290-01.

## Chinese Simplified（简体中文）

**警告**: ⚠产品上的这个标志意在警告用户该产品机壳内有暴露的危险电压，有触电危险。

**注意**：⚠ 产品上的这个标志意在提示用户设备随附的用户手册中有重要的操作和维护(维修) 说明。

关于我们产品的安全指南、遵循的规范、EMI/EMF 的兼容性、无障碍使用的特性等相关内容，敬请访问 Extron 网站 **www.extron.cn**，参见 Extron 安全规范指南，产品编号 68-290-01。

## Chinese Traditional（繁體中文）

**警告**: ⚠若產品上使用此符號，是為了提醒使用者，產品機殼內存在著可能會導致觸電之風險的未絕緣危險電壓。

**注意** ⚠ 若產品上使用此符號，是為了提醒使用者。

有關安全性指導方針、法規遵守、EMI/EMF 相容性、存取範圍和相關主題的詳細資訊，請瀏覽 Extron 網站：**www.extron.cn**，然後參閱《Extron 安全性與法規遵守手冊》，準則編號 68-290-01。

## Japanese

**警告:** この記号 ⚠ が製品上に表示されている場合は、筐体内に絶縁されていない高電圧が流れ、感電の危険があることを示しています。

**注意:** この記号 ⚠ が製品上に表示されている場合は、本機の取扱説明書に記載されている重要な操作と保守(整備)の指示についてユーザーの注意を喚起するものです。

安全上のご注意、法令遵守、EMI/EMF適合性、その他の関連項目については、エクストロンのウェブサイト**www.extron.jp**より『Extron Safety and Regulatory Compliance Guide』(P/N 68-290-01) をご覧ください。

## Korean

**경고:** 이 기호 ⚠, 가 제품에 사용될 경우, 제품의 인클로저 내에 있는 접지되지 않은 위험한 전류로 인해 사용자가 감전될 위험이 있음을 경고합니다.

**주의:** 이 기호 ⚠, 가 제품에 사용될 경우, 장비와 함께 제공된 책자에 나와 있는 주요 운영 및 유지보수(정비) 지침을 경고합니다.

안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트(**www.extron.co.kr**)의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

## FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. The Class A limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference; the user must correct the interference at his own expense.

**NOTE:** For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the ***Extron Safety and Regulatory Compliance Guide*** on the Extron website.

# Conventions Used in this Guide

## Notifications

**DANGER:** Danger indicates a situation that will result in death or severe injury.

**WARNING:** A warning indicates a situation that has the potential to result in death or severe injury.

**CAUTION:** A caution indicates a situation that may result in minor injury.

**ATTENTION:** Attention indicates a situation that may damage or destroy the product or associated equipment.

**NOTE:** A note draws attention to important information.

**TIP:** A tip provides a suggestion to make working with the application easier.

## Software Commands

**Commands** are written in the fonts shown here:

```
^AR Merge Scene,,Op1 scene 1,1 ^B 51 ^W^C
[Ø1] R ØØØ4 ØØ3ØØ ØØ4ØØ ØØ8ØØ ØØ6ØØ [Ø2] 35 [17] [Ø3]
Esc X1 * X17 * X20 * X23 * X21 CE←
```

**NOTE:** For commands and examples of computer or device responses mentioned in this guide, the character "Ø" is used for the number zero and "O" represents the capital letter "o."

**Computer responses** and **directory paths** that do not have variables are written in the font shown here:

```
Reply from 2Ø8.132.18Ø.48: bytes=32 times=2ms TTL=32
C:\Program Files\Extron
```

**Variables** are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx –t
SOH R Data STX Command ETB ETX
```

**Selectable items**, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

# Specifications Availability

Product specifications are available on the Extron website, **www.extron.com**.

# Contents

# Introduction

This guide describes the function, installation, and operation of the Extron HDMI DA2 distribution amplifier. Unless otherwise stated, the terms “distribution amplifier” or “DA” refer to the HDMI DA2.

This section provides the following information:



## About the HDMI DA2

The Extron HDMI DA2 distribution amplifier distributes one HDMI input signal to two outputs simultaneously. It is fully High-bandwidth Digital Content Protection (HDCP) compliant.

The HDMI DA2 supports data rates up to 6.75 Gbps (2.25 Gbps per color) with up to 12-bit deep color and uses the EDID Minder feature for EDID management.

The automatic output compatibility correction feature scans each output device to ensure that the output signal is compatible with the audio capabilities, color depth, and format requirements of the device. Each output is adjusted independently.

## HDMI DA2 Features

**HDMI signal distribution** — The HDMI DA2 accepts one HDMI input and provides two HDMI outputs.

**Key Minder** — Key Minder authenticates and maintains continuous HDCP encryption between the input and output devices to enable simultaneous distribution of a single encrypted source to two displays.

**Signal Status LEDs** — Front panel signal status LEDs indicate TMDS and HDCP status for the input and each output.

**EDID Minder** — This feature allows the user to choose from a list of 46 factory-loaded EDID files, to import EDID information from either of the display devices, or to import and save an EDID file from a PC. EDID Minder has two modes of operation that can be selected and configured using SIS commands:

- **Automatic:** EDID from the display connected to output 1 is read and stored at the input automatically (default mode). Use SIS commands to read and store EDID from output 2.
- **User assigned:** EDID can be manually assigned from the internal factory EDID table, which contains 46 unique EDID files categorized by native resolution and audio support. Additionally, there are four user slots available to store and recall EDID from connected displays.

**Output Compatibility Correction** — The HDMI DA2 monitors the EDID of each connected display to ensure it is compatible with the current input signal. The following adjustments are made for each output independently:

- **Interface format:** If the connected display is DVI and the input signal is HDMI, the signal is reformatted to DVI. If the output is HDMI and the input is DVI, no reformatting is needed because HDMI is backwards compatible with DVI.
- **Video color bit depth:** If the connected output device does not support the color bit depth of the input signal, it is truncated down to the next level that is supported (12-bit > 10-bit > 8-bit). The signal can be forced to always truncate to 8-bit via Simple Instruction Set (SIS) commands, disabling deep color.
- **Audio:** If the connected output device does not support the audio format of the input signal, audio is muted.

**NOTE:** These adjustments do not affect the actual video or audio data (there is no video scaling or audio decoding or mixing). It is up to the user or installer to ensure that the connected display device is compatible with the video resolution of the input signal.

**Easy mounting options** — The HDMI DA2 is a quarter rack wide, 1 inch high, and 3 inches deep, which allows the unit to be conveniently mounted in a rack or under furniture.

## HDMI DA2 Application Diagram

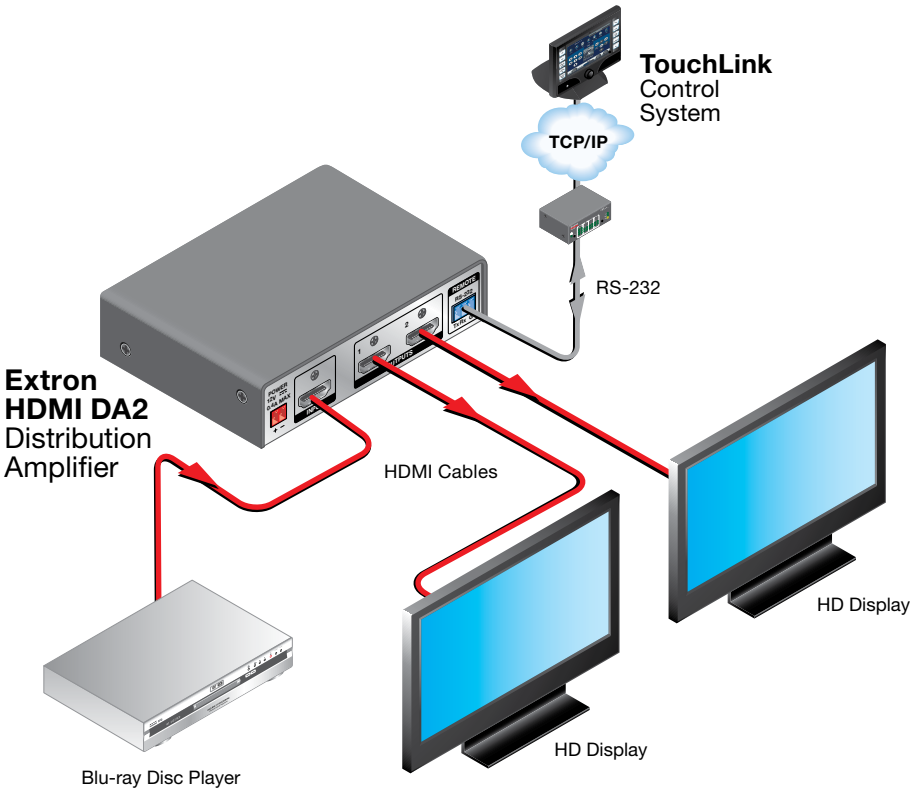



**Figure 1. HDMI DA2 Application Diagram**

# Installation

This section of the guide describes the following topics concerned with the installation and setup of the HDMI DA2 distribution amplifier.

- **Installation Overview**
- **Rear Panel Features**
- **Connecting the Power Supply**
- **Connecting the Input Source**
- **Connecting Output Displays**
- **Wiring for RS-232 Control**
- **Connecting to the USB Port**

## Installation Overview

To install and set up the HDMI DA2, follow these instructions:

1. **Mount the HDMI DA2** in a suitable location (see page 25).
2. **Connect the provided 12 VDC power supply** to the power connector. Be sure to read all attention points, notes, and warnings in this section before powering up the HDMI DA2 (see page 4).
3. **Connect the display devices** to the HDMI DA2 and power them on (see page 5).

   The distribution amplifier automatically reads and stores EDID from the display connected to output 1.
4. If necessary, connect a control PC to the **rear panel captive screw connector** (see page 6) or the **front panel USB port** (see page 7).
5. Configure the HDMI DA2, using **SIS commands** (see page 17).
6. Connect and power on the **input device** (see page 5).

## Rear Panel Features

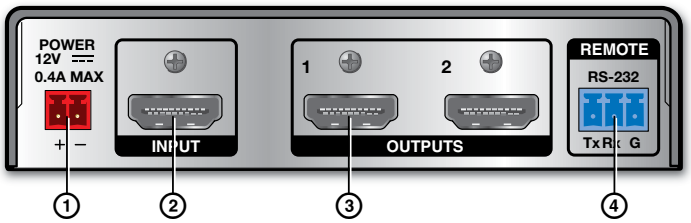



**Figure 2. HDMI DA2 Rear Panel**

1. Power supply connector
2. HDMI input connector
3. HDMI output connectors
4. RS-232 connectors

## Connecting the Power Supply

Connect the provided 12 VDC, 1 A power supply to the HDMI DA2 by following these instructions:

**WARNING:** Remove power before wiring. The two power cord wires must be kept separate while the power supply is plugged in.

**ATTENTION:**

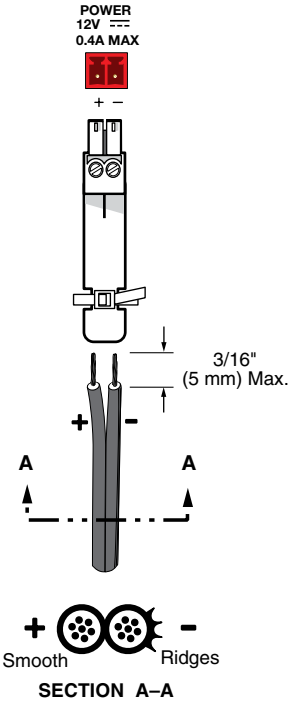
- This product is intended to be supplied by a Listed Power Unit marked "Class 2" or "LPS," rated 12 VDC, maximum 1.0 A. Always use a power supply supplied or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The power supply is to be located within the same vicinity as the Extron AV processing equipment in an ordinary location, Pollution Degree 2, secured to the equipment rack within the dedicated closet, podium, or desk.
- The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75, and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to building structure or similar structure.

1. Cut the DC output cord to the length needed.
2. Strip the jacket to expose 3/16 inch (5 mm) of the conductor wire.

**NOTES:**

- The length of the exposed wires in the stripping process is critical. The ideal length is 3/16 inches (5 mm). If the exposed section is longer, the exposed wires may touch, causing a short circuit between them. If it is shorter, the wires can be easily pulled out, even if tightly fastened by the captive screws.
- Do not tin the wires. Tinned wire does not hold its shape and can become loose over time.

3. Verify the polarity of the wires.
4. Slide the exposed end into the captive screw connector and secure by tightening the screw.
5. Use the supplied tie wrap to strap the power cord to the extended tail of the connector.

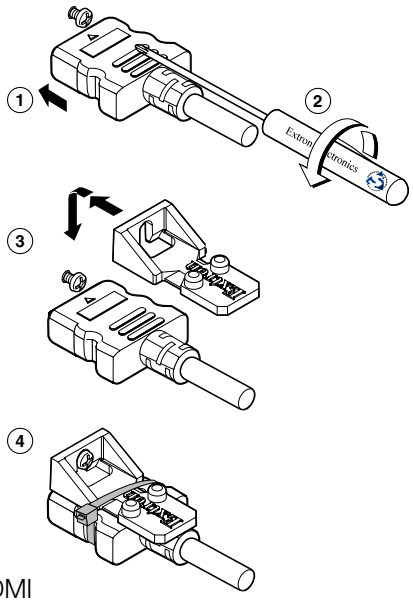


## Connecting the Input Source

Use an HDMI cable to connect the input source to the female HDMI socket on the rear panel (② in figure 2 on page 3).

The connectors are fully HDCP compliant. With cables up to 25 feet (7.6 m) they support resolutions of up to 1080p @ 60 Hz with 12-bit color. With cables up to 50 feet (15.2 m) they support 1080p or 1920x1200 @ 60 Hz with 8-bit color.

Follow these instructions to secure the input and output HDMI connectors to the HDMI DA2 with the LockIt HDMI lacing bracket provided:




1. Plug the HDMI cable into the panel connection.
2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it. The screw does not have to be removed.
3. Place the LockIt lacing bracket on the screw and against the HDMI connector, then tighten the screw to secure the bracket.

   **ATTENTION:** Do not overtighten the HDMI connection mounting screw. The shield it fastens to is very thin and can easily be stripped.

4. Loosely place the included tie wrap around the HDMI connector and the LockIt lacing bracket as shown.
5. While holding the connector securely against the lacing bracket, tighten the tie wrap, then remove any excess length.

## Connecting the Output Displays

Use a HDMI cable to connect up to two output displays to the female HDMI sockets on the rear panel (③ in **figure 2** on page 3).

**NOTE:** Secure the input and output HDMI connectors to the HDMI DA2 with the provided LockIt HDMI lacing bracket (see Connecting the Input Source, above).

Connect the primary display to output 1 since EDID from output 1 is read and stored automatically. If necessary, EDID can be configured using **SIS commands** (see page 17).

The HDMI DA2 monitors the EDID of each connected display to ensure it is compatible with the current input signal. The following adjustments are made for each output independently:

- **Interface format:** If the connected display is DVI and the input signal is HDMI, the signal is reformatted to DVI. If the output is HDMI and the input is DVI, no reformatting is needed because HDMI is backwards compatible with DVI.
- **Video color bit depth:** If the connected output device does not support the color bit depth of the input signal, it is truncated down to the next level that is supported (12-bit > 10-bit > 8-bit). The signal can be forced to always truncate to 8-bit via SIS commands, disabling deep color.
- **Audio:** If the connected output device does not support the audio format of the input signal, audio is muted.

If the source requires HDCP encryption and the display is not HDCP compliant, that output channel outputs a green screen.

Both outputs carry +5 VDC and up to 250 mA on pin 18, regulated by a current limiting circuit.

## Wiring for RS-232 Control (Optional)

RS-232 communication between the HDMI DA2 and a host PC can be used to update firmware or configure the distribution amplifier using SIS commands (see **Command and Response Table for SIS Commands** on page 17).

The computer connects to either the rear panel 3-pole RS-232 port (④ in **figure 2** on page 3) or the front panel USB port (② in **figure 7** on page 10) of the distribution amplifier.

**NOTES:**

- Neither port has precedence and commands from either port are handled in the order they are received.
- Extron recommends that the USB port is used for temporary connections. If a permanent connection is required, the RS-232 port should be used.

1. Connect an RS-232 cable, such as Extron universal control cable (UC 50' or UC100') to the computer, using a female 9-pin D connector (see figure 3, below):
   - Data received by the computer = pin 2
   - Data transmitted by the computer = pin 3
   - Ground = pin 5
2. Wire the opposite end of the cable to the provided 3-pole captive screw plug (see figure 3):
   - Data transmitted by the HDMI DA2 = pin 1, which plugs into the Tx (transmit) port
   - Data received by the HDMI DA2 = pin 2, which plugs into the Rx (receive) port
   - Ground = pin 3, which plugs into the G (ground) port

**NOTES:**

- The wiring in the RS-232 cables crosses over so that the Tx on the distribution amplifier connects to the Rx of the control device and vice versa. Ground always connects to ground.
- If you use cable that has a drain wire, tie the drain wire to the ground at both ends.

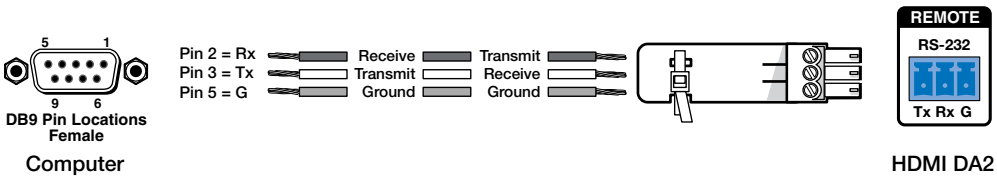



**Figure 3. Wiring the HDMI DA2 for RS-232 Control**

## Connecting to the USB Port

The mini Type B USB port is located on the HDMI DA2 front panel (② in **figure 7** on page 10). It can be used to connect the distribution amplifier to a host computer to update firmware or for configuration using SIS commands.

1. Connect a USB A to mini B cable between the USB Config port on the front panel of the HDMI DA2 and the USB port of the PC.

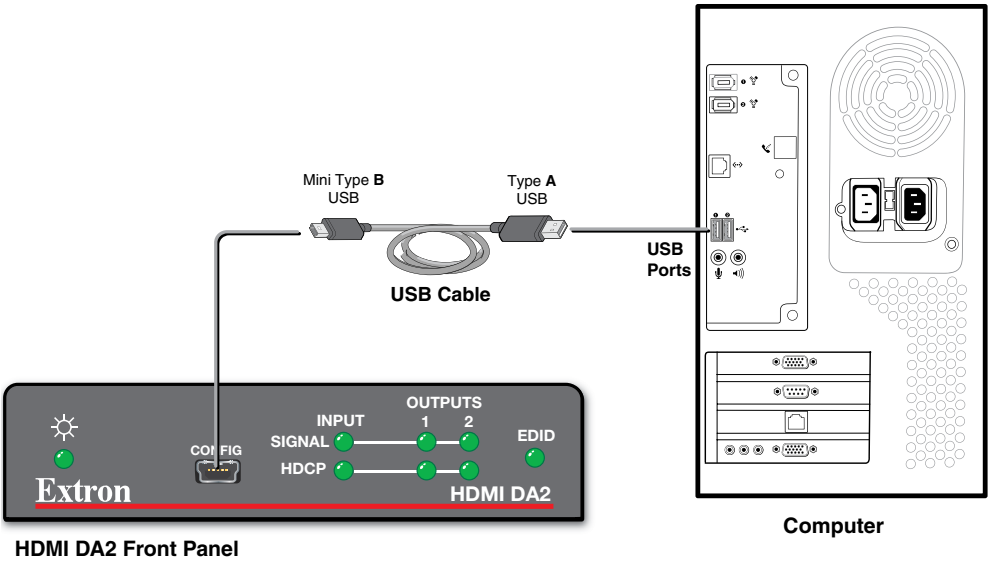



**Figure 4. Connecting a PC to the HDMI DA2 Front Panel USB Port**

2. If this is the first time an HDMI DA2 has been connected to the PC, the Found New Hardware Wizard opens. The first screen offers to connect to Windows Update to search the web for the appropriate driver needed for the USB port to communicate with the distribution amplifier. This is not necessary if the USB driver is already on your PC.


**Figure 5. Found New Hardware Wizard Welcome Screen**

- Select **`Yes, this time only`** to connect the PC to Windows Update only this one time.
- Select **`Yes, now, and every time I connect a device`** to automatically connect to Windows Update every time the HDMI DA2 connects to this USB port.
- Select **`No, not this time`** if you do not want to connect to Windows Update (for example, if the driver is already on the PC).

3. Click **`Next`**. The next screen of the Wizard opens:

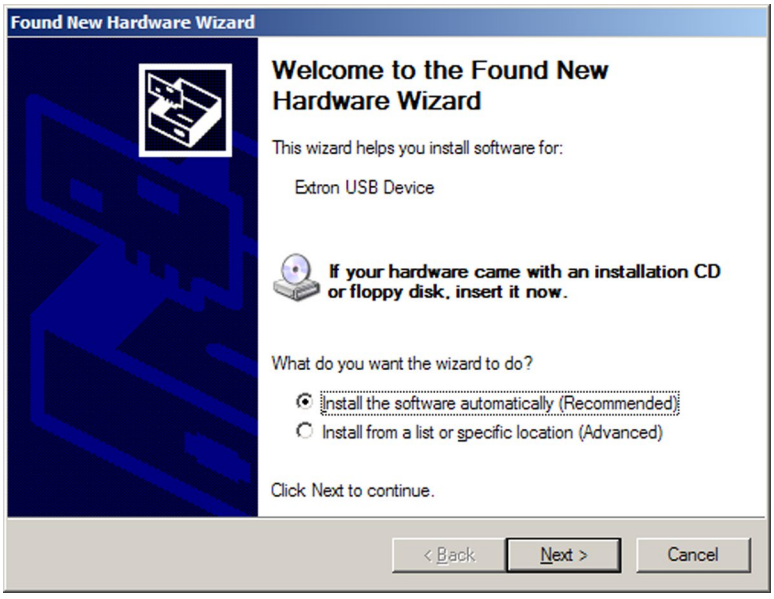



**Figure 6. Installing the Software Automatically**

4. Select **`Install the software automatically (Recommended)`** and click **`Next`**.

**NOTE:** You do not need to insert an installation disc.

The PC locates the driver needed and installs it in the correct location on the hard drive.

5. When the Completed screen appears, click **Finish** to close the wizard.

   **NOTE:** The wizard appears only on the first occasion you connect the HDMI DA2 to that USB port. The wizard reappears if you connect the HDMI DA2 to a different USB port or if you connect a different piece of equipment, requiring a different driver, to the same USB port.

6. Configure the HDMI DA2 as required (see **Operation** on page 10).

# Operation

This section of the manual provides information on:

- **HDMI DA2 Front Panel Features**
- **EDID Minder**

## HDMI DA2 Front Panel Features

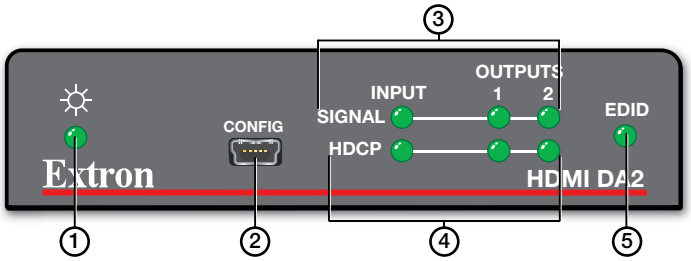



**Figure 7. HDMI DA2 Front Panel**

1. Power status LED
2. USB Config port
3. Signal LEDs
4. HDCP LEDs
5. EDID LED

### Power Status LED

The power status LED lights green when power is applied to the unit.

### USB Config Port

The USB Config port is used for SIS configuration, monitoring, and firmware updates. This port can be used as an alternative to the rear panel RS-232 captive screw connectors.

**NOTES:**

- Neither port has precedence and commands from either port are handled in the order they are received.
- Extron recommends that the USB port is used for temporary connections. If a permanent connection is required, the RS-232 port should be used.

When the USB Config Port is connected to the HDMI DA2 for the first time, the Found New Hardware Wizard opens to install the correct device driver (see **Connecting to the USB Port** on page 7).

## Signal Status LEDs

### Input Signal LED

The input signal LED lights green when a TMDS signal is detected on the HDMI input. If the source requires HDCP encryption, this LED may light only after the HDCP has been authenticated.

### Output Signal LEDs

There are two output signal LEDs, one for output 1 and the other for output 2. The LEDs light green when a TMDS signal is being transmitted to a sink device on the corresponding HDMI output.

### Input HDCP LED

The Input HDCP LED lights green when the source device requires HDCP encryption and it has been authenticated with the HDMI input.

### Output HDCP LEDs

There are two output HDCP LEDs, one for output 1 and the other for output 2. The LEDs light green when HDCP has been authenticated between the HDMI output and the corresponding sink device. This happens when the source device requires HDCP encryption and it has already been authenticated on the HDMI input.

The LEDs do not light if the source does not require HDCP encryption or if the sink is not HDCP compliant. If HDCP encryption is required but the sink device is not HDCP compliant, that output channel outputs a green screen.

## EDID LED

The EDID LED lights green when the EDID is successfully stored from the selected output device (output 1 by default).

The LED lights amber if the internal, factory-installed EDID is used or if the EDID was not successfully stored.

For information about using the EDID Minder, see **EDID Minder** on page 12.

# EDID Minder

EDID Minder ensures that the connected source sees the EDID of a display, even if a display is not connected. Depending on the EDID mode selected (by SIS command), the EDID of a connected display can be stored automatically, or the user can manually select from the table of factory loaded EDID files. This EDID is stored on an EEPROM located at the HDMI input.

By default, the HDMI DA2 is configured to store EDID from the display connected to output 1 automatically. The unit reverts to this configuration after a factory reset.

## Automatic Mode

In automatic mode, the HDMI DA2 automatically reads and stores EDID from output 1 (a different output can be chosen using SIS commands). This EDID is retained until a different display is connected or the unit is power-cycled. If no display is connected when the unit is powered on, then a factory default EDID (720p @ 60 Hz, 2-Ch audio) is present.

## User Assigned Mode

In user assigned mode, the user can select from 46 factory loaded EDID files, each catagorized by rate type (PC or HDTV), video format (DVI or HDMI), audio type (2-Ch or Multi-Ch), and native resolution. The unit retains this setting after a power cycle.

Additionally, four user-loaded slots are available to save the EDID of any connected display. EDIDs saved to these slots are retained after a power cycle. Upon a factory reset, these EDIDs revert to the factory default (720p @ 60 Hz, 2-Ch audio).

A table showing the factory loaded EDID options is shown on the following page. The EDID memory location is labelled X4 for consistency with the value in the SIS commands.

## HDMI DA2 Memory Locations

| X4 | Native Resolution | Refresh Rate | [1]Rate Type | [2]Video Format | [3]Audio Type | Pixel Clock | X4 | Native Resolution | Refresh Rate | [1]Rate Type | [2]Video Format | [3]Audio Type | Pixel Clock |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Output 1 (default) | | | | | | 30 | 1360x768 | 60 Hz | PC | HDMI | 2-ch | 85.5 MHz |
| 2 | Output 2 | | | | | | 31 | 1366x768 | 60 Hz | PC | HDMI | 2-ch | 86 MHz |
| 3 | Reserved | | | | | | 32 | 1440x900 | 60 Hz | PC | HDMI | 2-ch | 121.75 MHz |
| 4 | Reserved | | | | | | 33 | 1400x1050 | 60 Hz | PC | HDMI | 2-ch | 106.5 MHz |
| 5 | Reserved | | | | | | 34 | 1680x1050 | 60 Hz | PC | HDMI | 2-ch | 97.75 MHz |
| 6 | Reserved | | | | | | 35 | 1600x900 | 60 Hz | PC | HDMI | 2-ch | 162 MHz |
| 7 | Reserved | | | | | | 36 | 1600x1200 | 60 Hz | PC | HDMI | 2-ch | 119 MHz |
| 8 | Reserved | | | | | | 37 | 1920x1200 | 60 Hz | PC | HDMI | 2-ch | 154 MHz |
| 9 | 800x600 | 60 Hz | PC | DVI | n/a | 40 MHz | 38 | 2048x1080 | 60 Hz | PC | HDMI | 2-ch | 148.5 MHz |
| 10 | 1024x768 | 60 Hz | PC | DVI | n/a | 65 MHz | 39 | 480p | 60 Hz | HDTV | HDMI | 2-ch | 27 MHz |
| 11 | 1280x720 | 60 Hz | PC | DVI | n/a | 79.5 MHz | 40 | 576p | 50 Hz | HDTV | HDMI | 2-ch | 27 MHz |
| 12 | 1280x768 | 60 Hz | PC | DVI | n/a | 79.5 MHz | 41 | 720p | 50 Hz | HDTV | HDMI | 2-ch | 74.25 MHz |
| 13 | 1280x800 | 60 Hz | PC | DVI | n/a | 83.5 MHz | 42 | 720p | 60 Hz | HDTV | HDMI | 2-ch | 74.25 MHz |
| 14 | 1280x1024 | 60 Hz | PC | DVI | n/a | 108 MHz | 43 | 1080i | 50 Hz | HDTV | HDMI | 2-ch | 74.25 MHz |
| 15 | 1360x768 | 60 Hz | PC | DVI | n/a | 85.5 MHz | 44 | 1080i | 60 Hz | HDTV | HDMI | 2-ch | 74.25 MHz |
| 16 | 1366x768 | 60 Hz | PC | DVI | n/a | 86 MHz | 45 | 1080p | 50 Hz | HDTV | HDMI | 2-ch | 148.5 MHz |
| 17 | 1440x900 | 60 Hz | PC | DVI | n/a | 121.75 MHz | 46 | 1080p | 60 Hz | HDTV | HDMI | 2-ch | 148.5 MHz |
| 18 | 1400x1050 | 60 Hz | PC | DVI | n/a | 106.5 MHz | 47 | 480p | 60 Hz | HDTV | HDMI | multi-ch | 27 MHz |
| 19 | 1680x1050 | 60 Hz | PC | DVI | n/a | 97.75 MHz | 48 | 576p | 50 Hz | HDTV | HDMI | multi-ch | 27 MHz |
| 20 | 1600x900 | 60 Hz | PC | DVI | n/a | 162 MHz | 49 | 720p | 50 Hz | HDTV | HDMI | multi-ch | 74.25 MHz |
| 21 | 1600x1200 | 60 Hz | PC | DVI | n/a | 119 MHz | 50 | 720p | 60 Hz | HDTV | HDMI | multi-ch | 74.25 MHz |
| 22 | 1920x1080 | 60 Hz | PC | DVI | n/a | 148.5 MHz | 51 | 1080i | 50 Hz | HDTV | HDMI | multi-ch | 74.25 MHz |
| 23 | 1920x1200 | 60 Hz | PC | DVI | n/a | 154 MHz | 52 | 1080i | 60 Hz | HDTV | HDMI | multi-ch | 74.25 MHz |
| 24 | 2048x1080 | 60 Hz | PC | DVI | n/a | 148.5 MHz | 53 | 1080p | 50 Hz | HDTV | HDMI | multi-ch | 148.5 MHz |
| 25 | 800x600 | 60 Hz | PC | HDMI | 2-ch | 40 MHz | 54 | 1080p | 60 Hz | HDTV | HDMI | multi-ch | 148.5 MHz |
| 26 | 1024x768 | 60 Hz | PC | HDMI | 2-ch | 65 MHz | 55 | User loaded slot 1 | | | | | |
| 27 | 1280x768 | 60 Hz | PC | HDMI | 2-ch | 79.5 MHz | 56 | User loaded slot 2 | | | | | |
| 28 | 1280x800 | 60 Hz | PC | HDMI | 2-ch | 83.5 MHz | 57 | User loaded slot 3 | | | | | |
| 29 | 1280x1024 | 60 Hz | PC | HDMI | 2-ch | 108 MHz | 58 | User loaded slot 4 | | | | | |

**Table 1. HDMI DA2 Memory Locations ([1,2,3] see footnotes on the following page)**

## Footnotes for the EDID table (see page 13)

The following footnotes apply to the EDID table on the previous page:

[1]Rate Type

- PC: These are primarily VESA standard computer rates, based on the most commonly used native resolutions. They are designed to be used with computer sources.
- HDTV: These are video rates standardized by SMPTE and CEA. They are designed to be used with video and computer sources.

[2]Video Format

- DVI: These are 128-byte EDID files, which specify a DVI sink. They do not contain an extension block.
- HDMI: These are 256-byte EDID files, each containing a CEA extension block. They each specify an HDMI sink device with audio support.

[3]Audio Type

- n/a: These are DVI formatted EDID files; therefore, they do not support audio.
- 2-Ch: These are HDMI formatted EDID files, with support for basic 2-channel (stereo) audio.
  - LPCM (2-Ch)
- Multi-Ch: These are HDMI formatted EDID files with support for multiple audio formats, up to 8 channels.
  - LPCM (2-Ch)
  - LPCM (8-Ch
  - Dolby Digital (6-Ch)
  - DTS (7 Ch)
  - Dolby Digital Plus (8-Ch)
  - DTS-HD (8-Ch)
  - Dolby TrueHD (8-Ch)

# SIS Commands

This section provides information about the SIS commands that are used to configure the HDMI DA2. The following topics are discussed:



## Introduction to SIS

The HDMI DA2 accepts SIS commands from a host device such as a computer running the Extron DataViewer utility or other control system. The host device can be connected to the 3-pole captive screw connector on the rear panel or to the config port on the front panel.

The protocol is 9600 baud, 8 data bit, 1 stop bit, and no parity.

**NOTES:**

- The wiring in the RS-232 cables crosses over so that the HDMI DA2 transmit (Tx) wire connects with the control device receive (Rx) and vice versa.
- Only one serial port can be used at a time. If the front port is in use, the rear captive screw connector must be disconnected from the computer or other control device. Likewise, if the captive screw port is in use, the config port on the front panel must be disconnected from the computer or other control device.

SIS commands consist of strings (one or more characters per command field). Unless otherwise stated, upper and lower case characters can be used interchangeably. Commands do not require any special characters to begin or end the command string. Each response from the HDMI DA2 ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string.

When the HDMI DA2 is first switched on, it sends the message:

`(c) Copyright 2012, Extron Electronics HDMI DA Series, V x.xx, 60-997-01↵`
where `60-997-01` is the catalog part number and `V x.xx` is the firmware version number.

**NOTE:** This response is only seen when the control computer is connected by the rear panel RS-232 control port.

## Symbols Used in this Guide

When programming in the field, certain characters are most conveniently represented by their hexadecimal rather than their ASCII values. The table below shows the hexadecimal equivalent of each ASCII character:

| ASCII to HEX Conversion Table | | | | | | | | | | Esc | 1B | CR | ØD | LF | ØA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space | 2Ø | ! | 21 | " | 22 | # | 23 | $ | 24 | % | 25 | & | 26 | ' | 27 |
| ( | 28 | ) | 29 | * | 2A | + | 2B | , | 2C | - | 2D | . | 2E | / | 2F |
| Ø | 3Ø | 1 | 31 | 2 | 32 | 3 | 33 | 4 | 34 | 5 | 35 | 6 | 36 | 7 | 37 |
| 8 | 38 | 9 | 39 | : | 3A | ; | 3B | < | 3C | = | 3D | > | 3E | ? | 3F |
| @ | 4Ø | A | 41 | B | 42 | C | 43 | D | 44 | E | 45 | F | 46 | G | 47 |
| H | 48 | I | 49 | J | 4A | K | 4B | L | 4C | M | 4D | N | 4E | O | 4F |
| P | 5Ø | Q | 51 | R | 52 | S | 53 | T | 54 | U | 55 | V | 56 | W | 57 |
| X | 58 | Y | 59 | Z | 5A | [ | 5B | \ | 5C | ] | 5D | ^ | 5E | _ | 5F |
| ` | 6Ø | a | 61 | b | 62 | c | 63 | d | 64 | e | 65 | f | 66 | g | 67 |
| h | 68 | i | 69 | j | 6A | k | 6B | l | 6C | m | 6D | n | 6E | o | 6F |
| p | 7Ø | q | 71 | r | 72 | s | 73 | t | 74 | u | 75 | v | 76 | w | 77 |
| x | 78 | y | 79 | z | 7A | { | 7B | l | 7C | } | 7D | ~ | 7E | DEL | 7F |

**Table 2. ASCII to HEX Conversion Table**

↵ — carriage return with line feed

← — carriage return (no line feed)

• — space character

Esc — Escape key

The Xn values defined in this section are the variables used in the fields of the Command Response Table.

X1 — Output (1 or 2)

X2 — Status
Ø = disabled, off, or undetected
1 = enabled, on, or detected

X3 — Video color bit depth
Ø = auto (based on EDID of sink)
1 = force 8-bit
2 = pass-through

X4 — EDID memory location (see **HDMI DA2 Memory Locations Table** on page 13)

X5 — EDID data as 256 bytes of Hex data (text representation)

X6 — Native resolution and refresh rate (translated from Hex)
for example: 1600x1200 @60Hz

X7 — Controller firmware version to the second decimal place

## Error Messages

EØ1 — Invalid input channel number (too large)

E1Ø — Invalid command

E13 — Invalid value (too large)

## Command and Response Table for SIS Commands

| Command | ASCII Command (host to unit) | Response (unit to host) | Additional Description |
|---|---|---|---|
| **Video Mute** | | | |
| Video mute single output | X1*X2B | VmtX1*X2↵ | Video mute output X1 (1 or 2) |
| Video mute all outputs | X2B | VmtX2↵ | Video mute all outputs |
| Query Video mute status | B | VmtX2•X2↵ | output 1 status, output 2 status<br>X2 = 0 (mute disabled)<br>or 1 (mute enabled) |
| **Audio Mute** | | | |
| Audio mute single output | X1*X2Z | AmtX1*X2↵ | Audio mute output X1 (1 or 2)only |
| Audio mute all outputs | X2Z | AmtX2↵ | Audio mute all outputs |
| Query Audio mute status | Z | AmtX2•X2↵ | X2 = 0 (mute disabled)<br>or 1 (mute enabled) |
| **Video Color Bit Depth** | | | |
| Set video bit depth for a specific input | EscVX1*X3BITD← | X1BitdVX3↵ | X3 = 0 (auto, based on sink EDID)<br>1 (force 8-bit)<br>2 (pass-through, unmodified) |
| Set video bit depth for all inputs | EscV*X3BITD← | BitdVX3↵ | |
| View video bit depth for all inputs | EscV*BITD← | BitdVX3•X3↵ | video bit depth for output 1•video bit depth for output 2 |
| **Signal Status** | | | |
| Request all signal status | EscLS← | SigX2*X2•X2↵ | Shows the signal status (X2) for the input*output1•output2.<br>X2 = 0 (signal undetected)<br>or 1 (signal detected) |
| Request all HDCP status | EscHDCP← | HdcpX2*X2•X2↵ | X2 = 0 (HDCP off) or 1 (HDCP on) |
| **EDID Minder** | | | |
| Assign EDID to input | EscA*X4EDID← | EdidAX4↵ | X4 = EDID memory location (1-54) see **table 1** on page 13 |
| View EDID assignment | EscA*EDID← | X4↵ | |
| Save EDID of output to user location | EscSX1*X4EDID← | X1EdidSX4↵ | Store the EDID of output X1 into EDID memory location X4 |
| View/Read EDID in Hex | EscR*EDID← | X5↵ | Read out EDID in Hex from currently selected EDID |
| View EDID native resolution | EscN*EDID← | X6↵ | Resolution and refresh rate of currently selected EDID<br>*Example: 1600x1200@60Hz* |

| Command | ASCII Command (host to unit) | Response (unit to host) | Additional Description |
|---|---|---|---|
| **Other** | | | |
| Request part number | N | 6Ø-997-Ø1↵ | |
| Query firmware version | Q | X7↵ | X7 = Firmware build (2 decimal places) |
| Reset | Esc ZXXX← | Zpx↵ | |

# Updating Firmware

Updates to the HDMI DA2 firmware are released periodically on the Extron website. You can find which version is currently loaded on your DA using SIS commands. Compare this with the latest release on the Extron website and decide whether to update your firmware.

**TIP:** Read the Release Notes provided on the website with the latest firmware to determine whether you need the latest version.

This chapter describes how to update firmware for the HDMI DA2:

- **Downloading and Installing Firmware Loader**
- **Downloading HDMI DA2 Firmware**
- **Loading the Firmware to the HDMI DA2**

## Downloading and Installing Firmware Loader

Extron recommends using the Firmware Loader software to update the firmware on Extron products. If you do not already have Firmware Loader installed on your computer, download it as follows:

1. Go to the Extron website at **www.extron.com** and click the **Download** tab.
2. On the Download Center screen, click the **Software** link on the left sidebar menu.
3. On the next Download Center screen, locate Firmware Loader and click its **Download** link.


**Figure 8. Firmware Loader Download Link**

4. On the next screen, enter the requested information, then click the **Download** **fw_loader_vnxnxn.exe** button (where n is the Firmware Loader version number).
5. Follow the instructions on the rest of the download screens to save the executable Firmware Loader installer file to your computer. Note the folder to which the file was saved.
6. In Windows Explorer or another file browser, locate the downloaded executable installer file and double-click it to open it.
7. Follow the instructions on the Installation Wizard screens to install Firmware Loader on your computer. Unless you specify otherwise, the installer program places the Firmware Loader file, FWLoader.exe, at `c:\Program Files\Extron\FWLoader`.

## Downloading HDMI DA2 Firmware

To obtain the latest version of firmware for your HDMI DA2:

1. Visit the Extron website (**www.extron.com**), click the **Download** link at the top of the page, then click the **Firmware** link on the left sidebar menu.

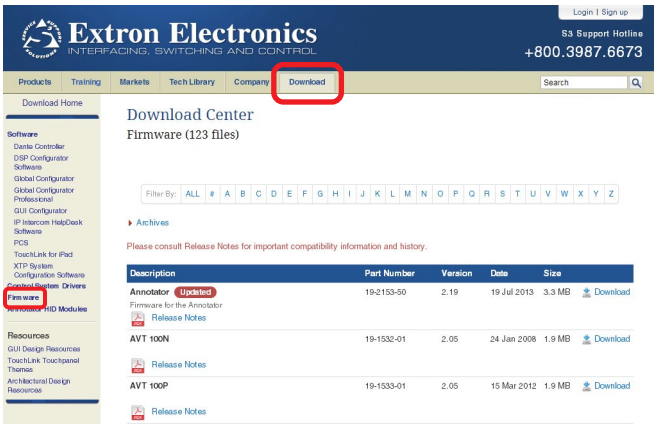



**Figure 9. Firmware Link on the Download Tab**

2. On the Download Center screen, locate the section for the HDMI DA2 firmware
3. (Optional) click **Release Notes**. These notes show the issues that have been addressed by the latest update. If these issues do not affect you, you may decide not to upgrade the firmware.
4. Click the **HDMI DA2 Download** link.
5. On the next screen that appears, enter the requested user information, then click the **Download** button.
6. Follow the instructions on the rest of the download screens to save the executable firmware file to your computer. Note the folder to which the file was saved.
7. In Windows Explorer or another file browser, locate the downloaded executable file, and double-click it to open it.
8. Follow the instructions on the Installation Wizard screens to install the new firmware on your computer. A Release Notes file and a set of instructions for updating the firmware are also loaded.

## Loading the Firmware to the HDMI DA2

To load a new version of firmware to the switcher using Firmware Loader, connect the control PC to the HDMI DA2. You may use the front panel USB config port or the rear panel 3-pole captive screw Remote port (see **Wiring for RS-232 Control** on page 6 for information on connecting to the serial port).

1. If you have not already done so, download and install the Firmware Loader executable installer file to your computer (see **Downloading and Installing Firmware Loader** on the previous page).
2. If necessary, download the latest version of HDMI DA2 firmware and install it on your computer (see **Downloading HDMI DA2 Firmware** on the previous page).
3. Open the Firmware Loader via your desktop **Start** menu by making the following selections:

   `Start` > `All Programs` > `Extron Electronics` > `Firmware Loader` > `Firmware Loader`

   The Firmware Loader window opens with the Add Device window displayed in front of it.

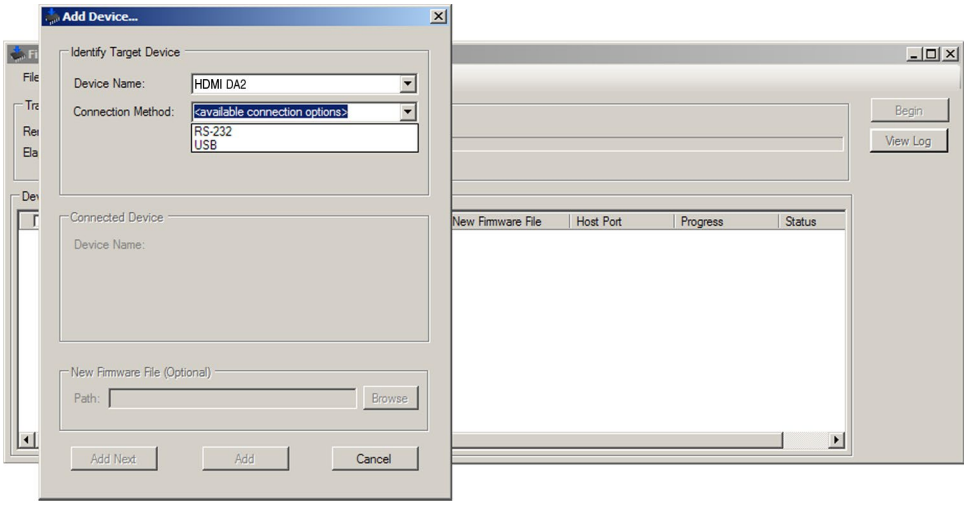



**Figure 10. Opening Firmware Loader**

4. On the Add Device window, select **HDMI DA2** from the **Device Names** drop-down menu.
5. From the **Connection Method** drop-down menu, select either **RS-232** or **USB**.
6. Depending on the connection method that you selected, additional options appear. Make the appropriate selections for your connection method.
   - **RS-232**: Select the appropriate options from the **Com Port** and **Baud Rate** menus (this information is provided by your system administrator).
   - **USB**: Only the **Extron USB Device_Ø** option is available on the **Available Devices** menu. Make sure that it is selected.
7. Click **Connect**. If the connection is successful, HDMI DA2 is displayed in green in the Connected Device section, followed by a green check mark.
8. Click the **Browse** button in the New Firmware File (Optional) section.

9. On the Open window, navigate to the new firmware file, which has an S19 extension, and double-click it.

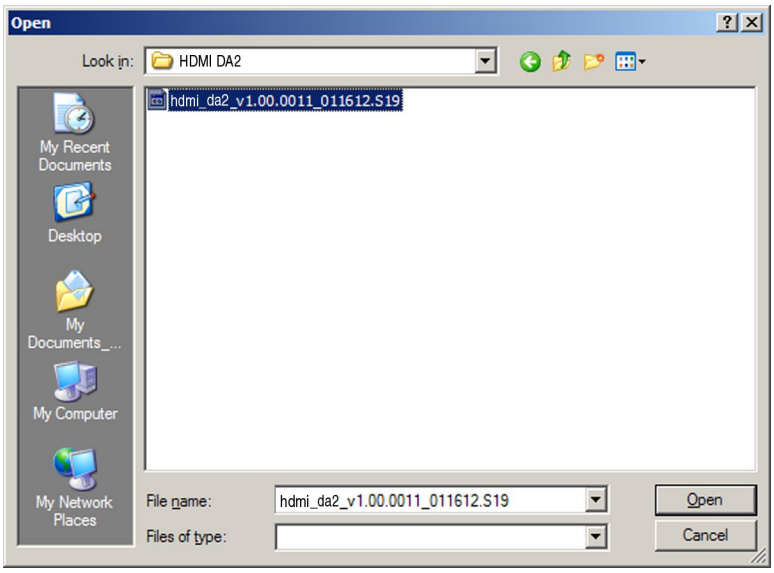



**Figure 11. Open Window for Firmware File Selection**

**ATTENTION:** Valid firmware files must have the file extension **S19**. A file with any other extension is not a firmware upgrade for this product and could cause the HDMI DA2 to stop functioning.

**NOTES:**

- The original factory-installed firmware is permanently available on the HDMI DA2. If the attempted firmware upload fails for any reason, the unit reverts to the factory version.
- When downloaded from the Extron website, by default the firmware is placed in a folder at `C:\Program Files\Extron\Firmware\HDMI DA2` (Windows XP) or `C:\Program Files (x86)\Extron\Firmware\HDMI DA2` (Windows 7).

On the Add Device window, the path to the new firmware file is displayed in the **Path** field.

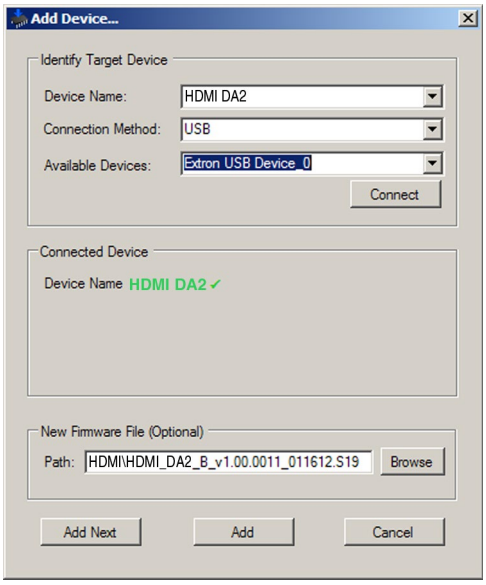



**Figure 12. Path to the New Firmware File on the Add Device Window**

10. **If this is the only device to which you are uploading firmware,** click **Add**. The HDMI DA2 information is added to the Devices section of the Firmware Loader window and the Add Device window closes.

    **If you will be uploading the firmware to multiple HDMI DA2 units** that are connected to your computer, do the following:

    a. Click **Add Next**. Your first device is added to the Devices section of Firmware Loader window, and the Add Device window remains open.

    b. For each additional device you want to add to the Firmware Loader window, repeat steps 5 through 9, then click **Add Next**.

    c. For the **last** device, click **Add** (instead of **Add Next**) to add the device and to close the Add Device window.

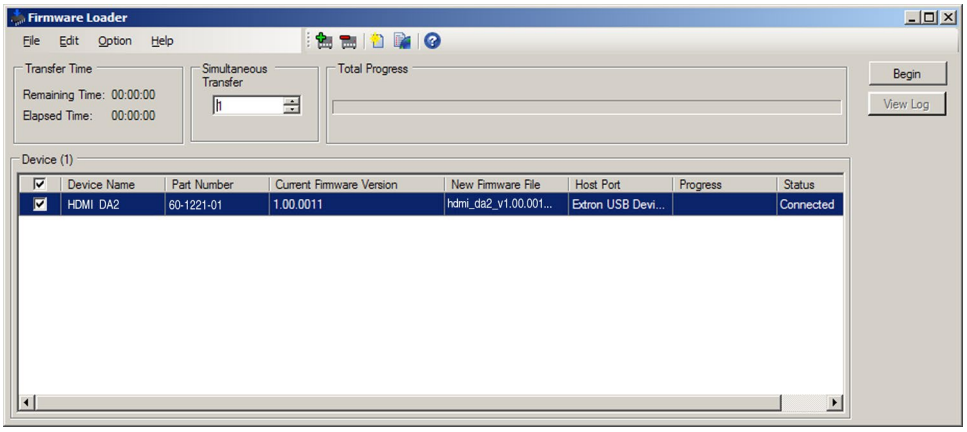



**Figure 13. Firmware Loader Screen with a HDMI DA2 Added**

11. If you want to remove a device from the Devices section, do the following:
    1. Click on the names of the devices to be deleted, to highlight them.
    2. Select **`Remove Selected Device(s)`** from the **`Edit`** menu.
    3. On the Remove Device(s) window, select or deselect any devices on the list as desired, then click **`Remove`**.

    To remove **all** devices, select **`Remove All Devices`** from the **`Edit`** menu.
12. Click **`Begin`**. The following indicators show the progress of the update:
    - The Transfer Time section shows the amounts of remaining and elapsed time for the update.
    - The Total Progress section displays a progress bar with `Uploading...` above it.
    - In the Devices section, the Progress column displays an incrementing percentage and another progress bar. The Status column displays `Uploading`.
13. The upload is complete when the **`Remaining Time`** field shows `00.00.00`, the Progress column shows `100%`, and `Completed` is displayed above the progress bar and in the **`Status`** field. Close the Firmware Loader window.

# Mounting

## Desktop Placement

Attach the four provided rubber feet to the bottom of the HDMI DA2 and place it in any convenient location.

## Rack Mounting

### UL Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines are relevant to the safe installation of these products in a rack:

1. **Elevated operating ambient temperature** — If the unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (Tma: +122 °F, +50 °C) specified by Extron.
2. **Reduced air flow** — Install the equipment in the rack so that the equipment gets adequate air flow for safe operation.
3. **Mechanical loading** — Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.
4. **Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Consider the equipment nameplate ratings when addressing this concern.
5. **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

### Rack Mounting Procedure

The unit can be mounted on any of the optional Extron rack systems. To mount the unit on a rack shelf, follow the instructions provided with the shelf kit.

## Under-desk Mounting

Mount the unit under a desk or podium, using an optional Extron under-desk mounting kit. Follow the instructions provided with the kit.

# Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America, and Central America:**
Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

**Japan:**
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

**Europe and Africa:**
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

**China:**
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

**Asia:**
Extron Electronics Asia Pte. Ltd.
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

**Middle East:**
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

**NOTE:** If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

| | | | |
|---|---|---|---|
| **USA:** | 714.491.1500 or 800.633.9876 | **Europe:** | 31.33.453.4040 |
| **Asia:** | 65.6383.4400 | **Japan:** | 81.3.3511.7655 |

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.


| Extron Headquarters | Extron Europe | Extron Asia | Extron Japan | Extron China | Extron Middle East | Extron Korea | Extron India |
|---|---|---|---|---|---|---|---|
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